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Forest Insect and Disease Management

5230
BIOLOGICAL
EVALUATION R2-77-2

MOUNTAIN PINE BEETLE

Shoshone National Forest
Bureau of Land Management
State and Private Land
South Pass City &
Atlantic City, Wyoming

JUNE 1977



Rocky Mountain Region

U.S. Department of Agriculture Forest Service

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INTRODUCTION

The mountain pine beetle, *Dendroctonus ponderosae* Hopkins, continues to cause extensive mortality on Federal, State and private lands near South Pass City and Atlantic City, Wyoming.

On May 17 and 18, 1977, Kent Eggleston and Ronald MacDonald, Biological Technicians, visited the area of infestation and conducted a brood survey of infested lodgepole pine, *Pinus contorta* Douglas. The purpose of the survey was to evaluate the overwintering population and predict the population trend for 1977. Utilizing Cole's sequential sampling procedure,^{1/} which is based on bark samples, the trend for the current infestation was determined at seven locations (Table 1). Brood samples from all sample areas showed that the population was increasing. The mountain pine beetle is again expected to cause epidemic losses of lodgepole pine on all lands.

TECHNICAL INFORMATION

CAUSAL AGENT: *Dendroctonus ponderosae* Hopkins, mountain pine beetle

HOST: *Pinus contorta* Douglas, lodgepole pine
Pinus flexilis James, limber pine

LIFE HISTORY: The mountain pine beetle has one generation per year. Adults attack trees from July through August by boring through the bark to the cambium. The females then tunnel upward for 12 inches to 30 inches (these tunnels are called egg galleries). The females lay eggs in individual niches along each side of the gallery which is then packed with frass. After hatching, the larvae feed in individual channels (larval galleries)

1/

COLE, W. E. The mountain pine beetle in lodgepole pine. Progress Report - Study 1. USDA, For. Serv. INT. 4500-FS-INT-2201. 25 pp. (for internal use only)

at right angles to the egg gallery in the phloem. The insect overwinters in the larval stage. In the spring, when the larvae are fully developed, they excavate an oval chamber at the end of the larval gallery and pupate. Finally, mature adults emerge from the chamber by boring through the outer bark and fly to attack new trees, completing the generation.

METHODS

In accordance with Cole's sampling procedure, two counts of developing brood from 6-by-6-inch samples were taken at dbh on opposite sides of infested lodgepole pine trees. Samples were taken at seven sites: Upper Willow Creek, Rock Creek, Slate Creek, Lower Snow Basin and Upper, Lower and Middle Pass Creek.

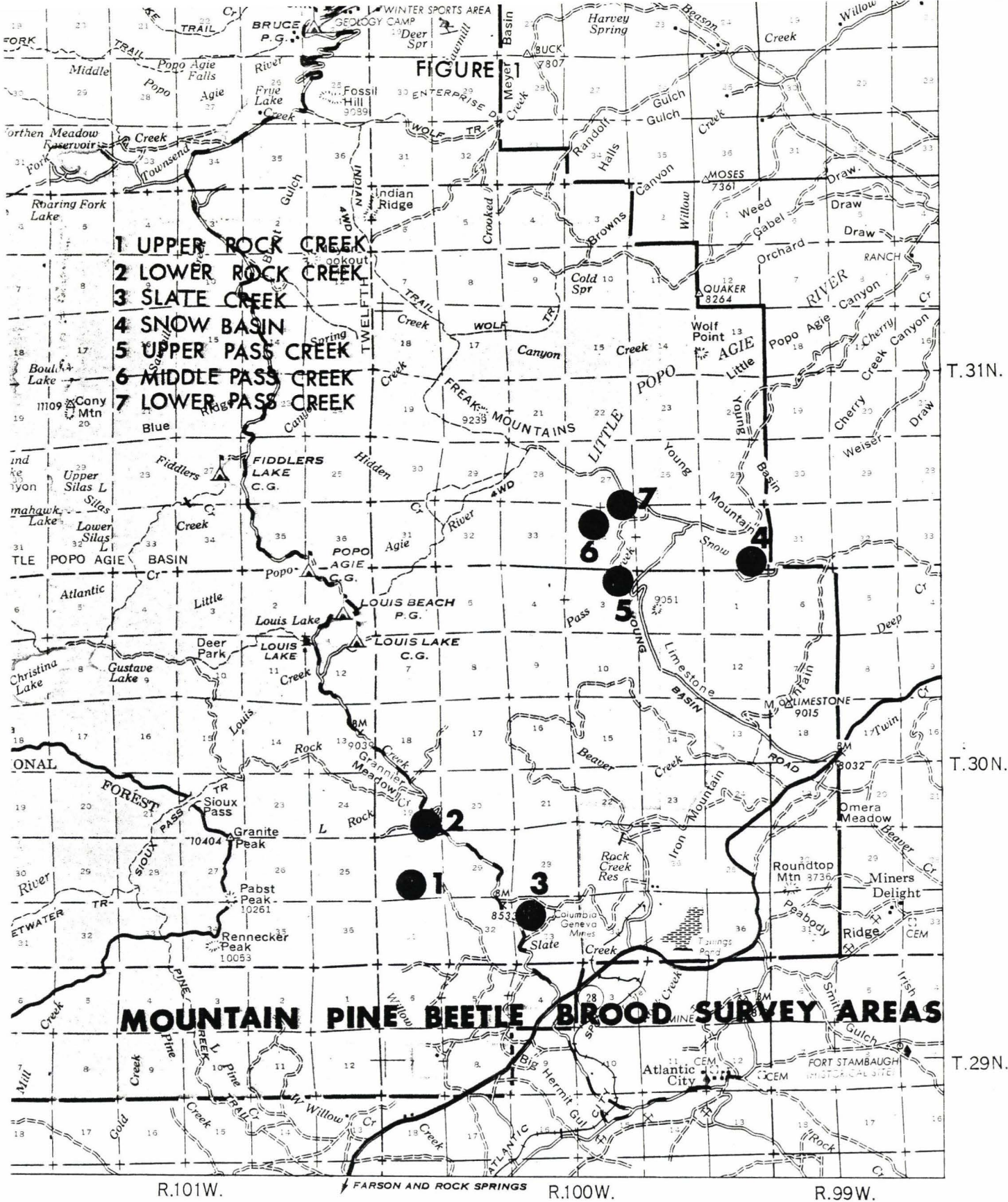
RESULTS AND CONCLUSIONS

At all locations sampled, brood numbers indicated an increase in the population. Predators, parasites and woodpeckers were not effective in controlling the beetle. Data from all sample locations are summarized in Table 1. All samples were taken on National Forest lands.

The mountain pine beetle infestation in the South Pass City and Atlantic City area may be expected to continue to cause epidemic losses of lodgepole pine.

RECOMMENDATIONS

The general long-term protection measure to reduce beetle attacks within a given stand is to reduce average dbh of the stand below 8 inches. Present efforts on the existing timber sales should be continued. Adjacent timber sales should be set up and management plans made to enter uninfested areas, reducing the dbh of these areas before the infestation spreads to them. By reducing the average dbh of uninfested areas, the potential for epidemic losses will be reduced.



Polyconic projection
 1927 North American datum

H

50'

I

40'

1977 LANDER MPB-LPP BROOD SURVEY

SAMPLE AREA	NUMBER TREES SAMPLED	AVERAGE D.B.H.	BROOD		STARTS		INCHES OF GALLERY		PARASITES & PREDATORS		WOODPECKERING	BASAL AREA (FT ² /ACRE)	ELEVATION (FEET)	POPULATION TREND
			TOTAL	AVERAGE ±	TOTAL	AVERAGE ±	TOTAL	AVERAGE ±	Clerids	Coelodea sp.				
Upper Willow Creek	5	13.5	234	23.4 ± 3.72	31	3.1 ± .48	344	34.4 ± 4.12	22		Light	130	8,500	Increasing
Rock Creek	2	18.3	100	25.0 ± 3.40	20	5.0 ± .58	196	49.0 ± 7.25	11		Moderate	130	9,000	Increasing
State Creek	5	12.7	229	22.9 ± 4.97	41	4.1 ± .38	355	35.5 ± 4.31	15	4	Light	100	8,500	Increasing
Lower Snow Basin	4	12.5	134	16.75 ± 8.78	20	2.5 ± .93	262	32.75 ± 11.70			Moderate	100	8,000	Increasing
Upper Pass Creek	4	11.2	243	30.38 ± 3.68	25	3.13 ± .30	391	48.88 ± 3.29			Moderate	70	8,700	Increasing
Lower Pass Creek	5	9.7	153	15.30 ± 5.27	23	2.30 ± .26	233	23.30 ± 3.27			Moderate	120	8,500	Increasing
Middle Pass Creek	4	12.5	197	24.63 ± 5.81	16	2.00 ± .38	212	26.50 ± 2.99			Moderate	100	8,500	Increasing
TOTALS	29	12.4	1,290	22.24 ± 2.10	176	3.03 ± .21	1,993	34.36 ± 2.32	48	4				

± 0.49

± values are one standard error